REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application.

Claims 1-20 are now present in this application. Claims 1 and 13 are independent.

Reconsideration of this application is respectfully requested.

Rejection Under 35 U.S.C. § 102

Claims 1, 2, 5 and 6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by WO 02/40761 to Yoon et al. ("Yoon"). This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

During patent examination the PTO bears the initial burden of presenting a *prima facie* case of unpatentability. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444(Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788(Fed. Cir. 1984). If the PTO fails to meet this burden, then Applicants are entitled to the patent.

Applicants respectfully submit that the PTO has failed to meet this burden.

A prior art reference anticipates the subject matter of a claim when that reference discloses every feature of the claimed invention, either explicitly or inherently. In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) and Hazani v. Int'l Trade Comm'n, 126 F.3d 1473, 1477, 44 USPQ2d 1358, 1361 (Fed Cir. 1997). While, of course, it is possible that it is inherent in the operation of the prior art device that a particular element

operates as theorized by the examiner, inherency may not be established by probabilities or possibilities. In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) and In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Yoon does not disclose the invention, either explicitly or inherently in the claimed invention. Independent claim 1 recites a combination of features, including a rotation transmission means for transmitting a rotational force of the induction motor to rotate the inner tub with a rotational speed lower than a rotational speed of the induction motor in laundering operation, and to rotate the inner tub with a rotational speed identical to the rotational speed of the induction motor in dehydrating operation.

Yoon never mentions, or otherwise discloses, (1) the speed of its motor, or (2) the relationship of the speed of its motor to the speed of either of its two separately rotating tubs in (a) normal operation, or (b) in dehydrating operation. This statement is especially true with respect to the portion of Yoon that is relied on in this rejection, i.e., page 11, lines 13-25, which only discusses the separate rotation directions of Yoon's two concentric drums, either in the same direction or in opposite directions with respect to one another.

Accordingly, the Office Action fails to make out a *prima facie* case of anticipation of claims 1, 2, 5 and 6 by Yoon.

Reconsideration and withdrawal of this rejection of claims 1, 2, 5 and 6 are respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 2, 5 and 6 stand rejected under 35 USC § 103(a) as being unpatentable over Yoon in view of either U.S. Patent 5,669,095 to Dausch et al. ("Dausch") or EP 0949374 to Koshiga et al. ("Koshiga"). This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

Because the rejection is based on 35 U.S.C. § 103, what is in issue in such a rejection is "the invention as a whole", not just a few features of the claimed invention. Under 35 U.S.C. § 103, " [a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The determination under section 103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. See In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). In determining obviousness, the Examiner must explain what the differences between the claimed invention and the prior art are and provide objective factual evidence to support a conclusion that it would be obvious to one of ordinary skill in the art to achieve the claimed invention, which includes those missing features.

In the second place, in rejecting claims under 35 U.S.C. §103, it is incumbent on the examiner to establish a factual basis to support the legal conclusion of obviousness. See, In re Eine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is

expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. F-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. Note, In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding." C.R. Bard, Inc. v. M3 Sys. Inc.,

157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232(Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not "evidence." See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).

Moreover, a factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

Yoon does not anticipate claims 1, 2, 5 and 6 for reasons discussed above. Moreover, neither Dausch nor Koshiga are being applied to remedy the aforementioned deficiencies of Yoon. For example, neither Dausch nor Koshiga contains any disclosure or suggestion of including a rotation transmission means for transmitting a rotational force of the induction motor to rotate the inner tub with a rotational speed lower than a rotational speed of the induction motor in laundering operation, and to rotate the inner tub with a rotational speed identical to the rotational speed of the induction motor in dehydrating operation, as claimed.

Dausch only mentions using AC induction motors as one of many types that can be used in washing machines to provide measurements of the amount of load on a washer agitator – see col. 4, lines 11-43 of Dausch, and fails to mention what this has to do with including a rotation transmission means for transmitting a rotational force of the induction motor to rotate the inner tub with a rotational speed lower than a rotational speed of the induction motor in laundering operation, and to rotate the inner tub with a rotational speed identical to the rotational speed of the induction motor in dehydrating operation, as claimed.

Koshiga's disclosure of a gap between the stator and rotor is only disclosed in regard to "consideration of fluctuation of parts" to prevent the magnet from contacting the stator, and in regard to the eccentric amount of the stator – see paragraph '0025], but fails to mention what this has to do with including a rotation transmission means for transmitting a rotational force of the induction motor to rotate the inner tub with a rotational speed lower than a rotational speed of the induction motor in laundering operation, and to rotate the inner tub with a rotational speed identical to the rotational speed of the induction motor in dehydrating operation, as claimed.

Thus, the Office Action fails to provide objective factual evidence that one of ordinary skill in the art would be properly motivated to modify Yoon to achieve the claimed invention.

Moreover, because not one of these three references discloses or suggests including a rotation transmission means for transmitting a rotational force of the induction motor to rotate the inner tub with a rotational speed lower than a rotational speed of the induction motor in laundering operation, and to rotate the inner tub with a rotational speed identical to the rotational speed of the induction motor in dehydrating operation, as claimed, no matter how these three references are combined, they would not result in, or otherwise render obvious, the claimed invention.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of claims 1, 2, 5 and 6 by Yoon in view of Dausch or Koshiga.

Reconsideration and withdrawal of this rejection of claims 1, 2 5 and 6 are respectfully requested.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoon in view JP 2001-204989 to Mikio et al. ("Mikio"). This rejection is respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

Initially, although the rejection refers to a "machine translation" of Mikio, no such translation was mailed to Applicants. Applicants have, however, downloaded a machine translation of Mikio from the Japanese Patent Office (JPO) Internet website, a copy of which is attached hereto, and refer that translation in responding to this rejection.

Yoon does not anticipate, or render obvious, claim 1, from which claim 3 depends, for reasons discussed above. Moreover, Mikio is not being applied to remedy the aforementioned deficiencies of Yoon. Accordingly, even if one of ordinary skill in the art were properly motivated to modify Yoon, as suggested, the modified version of Yoon would still not render obvious the claimed invention.

Additionally, Applicants respectfully submit that Mikio does not disclose first and second spline shafts. In this regard, applicants respectfully submit that Mikio only discloses gear teeth 18 and 15, as discussed in paragraphs [0022]-[0028] of the computer generated English language translation by the JPO of Mikio. The Office Action does not provide objective factual evidence that Mikio's gear teeth 15 and 18 are splines.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of claim 3 by Yoon in view of Mikio.

Reconsideration and withdrawal of this rejection of claim 3 are respectfully requested.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoon in view JP 2001-204989 to Mikio et al. ("Mikio") and further in view of U.S. Patent 5,209,085 to Brien. This rejection is respectfully traversed.

Yoon not anticipate or otherwise render obvious claim 1, from which 4 depends, and the Yoon-Mikio reference combination does not render obvious claim 3, from which claim 4 depends, for reasons discussed above.

Moreover, Brien is not being applied to remedy the aforementioned deficiencies of Yoon or the Yoon-Mikio reference combination.

Accordingly, even if one of ordinary skill in the art were properly motivated to modify the Yoon-Mikio reference combination, as suggested, the modified version of Bae would still not render obvious the claimed invention.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of claim 4 by Yoon and Mikio in view of Brien.

Reconsideration and withdrawal of this rejection of claim 4 are respectfully requested.

Allowed and Allowable Subject Matter

Applicants acknowledge with appreciation the allowance of claims 13-20. The Office Action indicates that claims 7-12 would be allowable if rewritten in independent form. Applicants thank the Examiner for the early indication of allowable subject matter in claims 7-12 and respectfully submit that claim 1, from which claims 7-12 depend, is allowable for reasons discussed above. Because of this, Applicants have not-re-written claim 7 in independent form.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Robert J. Webster, Registration No. 46,472, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Reply is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: July 18, 2007

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

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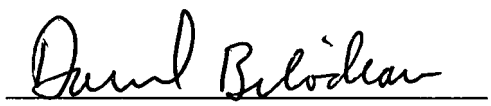
Registration No. 42,325

By: 

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Attachment: JPO Internet Website provided Machine translation of JP 2001-204989 (17 pages)

PATENT ABSTRACTS OF JAPAN

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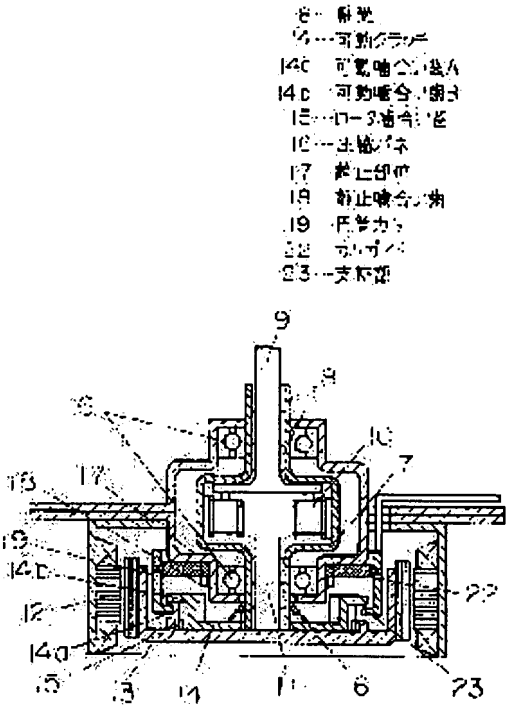
(54) WASHING MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To make a highly reliable claw clutch mechanism thin with a simple constitution to make a drive device thin.

SOLUTION: Rotor claw teeth 15 are provided in a rotor 13 in the drive device of a washing machine in which a reduction mechanism 10, a claw clutch mechanism, and a driving motor 12 are provided on the same shaft. Each tooth form of a claw clutch is formed of a spline constitution to thin the clutch mechanism and internally included in the rotor 13. In this way, the driving device provided with the reliable clutch mechanism is made thin.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or

application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The dehydration shaft made to rotate a dehydration tack and the wash shaft turning around the impeller which it is arranged by said dehydration shaft on the same axle, and was arranged in said dehydration tack, The moderation device by which connected said wash shaft to the output side, has connected the driving shaft to an input side, and endocyst is carried out into said dehydration shaft, Said dehydration shaft is set as rotation of the drive motor made to rotate said dehydration shaft and said driving shaft and said drive motor un-transmitting [transfer or]. And the Rota engagement gear tooth in which it is the washing machine equipped with the engagement clutch device which fixes a dehydration shaft at the time of un-transmitting, Rota of said drive motor was connected with the lower part of said driving shaft, and said engagement clutch device was prepared in said Rota, The movable clutch equipped with the quiescence engagement gear tooth formed in the quiescence part, the movable engagement gear tooth A which is engaging with said dehydration shaft and gears alternatively for said Rota engagement gear tooth or said quiescence engagement gear tooth, and the movable engagement gear tooth B, Constitute from a clutch migration means to which said movable clutch is moved, and said quiescence engagement gear tooth and said Rota engagement gear tooth are located up and down. Said movable clutch is arranged movable up and down between said quiescence engagement gear tooth and said Rota engagement gear tooth. The washing machine which considered tooth form of said movable engagement gear tooth A and said movable engagement gear tooth B, said Rota engagement gear tooth, and said quiescence engagement gear tooth as the spline configuration, and connoted said engagement clutch device in said Rota.
[Claim 2] The washing machine according to claim 1 which considered the engagement section of a movable clutch and a dehydration shaft as the spline configuration.
[Claim 3] Use a DC motor for a drive motor and each number of teeth of the quiescence engagement gear tooth formed in the movable engagement gear tooth A and the movable engagement gear tooth B which were formed in the movable clutch, the Rota engagement gear tooth formed in Rota, and the quiescence part is made into the pole and the same number of a drive motor, or a multiple. The washing machine according to claim 1 or 2 attached said movable engagement gear tooth A, said Rota engagement gear tooth and said movable engagement gear tooth B, and the first half so that a quiescence engagement gear tooth might be come to the physical relationship of respectively engagement when it energized without sending a rotation signal to a drive motor.
[Claim 4] The washing machine according to claim 3 which made the taper-like section tooth form of at least one or more engagement entries among the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and the quiescence engagement gear tooth.
[Claim 5] Claim 1 which constituted at least one or more of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and quiescence engagement gear teeth from resin thru/or the washing machine of 4 indicated in any 1 term at least.
[Claim 6] It is [claim 1 which prepared the buffer member between a movable clutch and Rota thru/or] a washing machine given in any 1 term of 5 at least.

[Claim 7] Claim 1 which made thickness of a movable clutch thicker than other parts near the engagement section with a dehydration shaft thru/or the washing machine of 6 indicated in any 1 term at least.

[Translation done.]

NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the washing machine which washes the washing with a dehydration tack.
[0002]
[Description of the Prior Art] The automatic washing machine currently used conventionally has composition as shown in drawing 10 . That is, in the body 41, the receiver barrel 43 supported by the suspension 42 was formed, and it has the dehydration tack 44 which served as laundry sink in the receiver barrel 43. The dehydration tack 44 is carrying out opening of the top panel, and can throw in the washing now from a top panel. Moreover, at the pars basilaris ossis occipitalis, it has an impeller 45, and has many holes in the side face. The dehydration tack 44 is being fixed to the dehydration shaft 47 currently supported by bearing 46. Moreover, the impeller 45 is being fixed to the wash shaft 49 currently supported by bearing inside the dehydration shaft 47. Rota 53 of a drive motor 52 is connected with the lower part of the driving shaft 51 which this wash shaft 49 leads to the moderation device 50, and leads to the input side of the moderation device 50. Moreover, it has the spring-clutch device 54 for switching transfer and un-transmitting to the dehydration shaft 47 of rotation of a drive motor 52 to the lower part of the dehydration shaft 47, and a part of Rota 53. Moreover, while, as for the dehydration shaft 47, this part connotes the moderation device 50 by forming a shaft-orientations interstitial segment greatly in a path, it also has the function as a brake drum 55. This brake drum 55 constitutes the band-brake device with the brake band (not shown) prepared in that perimeter.
[0003] With the above configuration, a dehydration tack 44 is fixed, and a band-brake device fixes the dehydration shaft 47, and in the process which performs wash and a rinse only by rotation of an impeller 45, the spring-clutch device 54 does not transmit rotation of a drive motor 52 to the dehydration shaft 47, but rotates only a driving shaft 51. Consequently, rotation of a drive motor 52 is slowed down according to the moderation device 50, becomes [being transmitted to an impeller 45, and] through the wash shaft 49, and gives mechanical power to the washing-ed. In this way, wash and a rinse of the washing held in the dehydration tack 44 are performed.
[0004] Moreover, a dehydration tack 44 is rotated, and in the stroke which performs wash, a rinse, and dehydration, a band-brake device releases immobilization of the dehydration shaft 47, the spring-clutch device 54 transmits rotation of a drive motor 52 to the dehydration shaft 47, and synchronizes and rotates a driving shaft 51, the dehydration shaft 47, and the moderation device 50, and it rotates, without also slowing down the wash shaft 49 according to the moderation device 50. Consequently, a dehydration tack 44 and an impeller 45 synchronize and rotate. In this way, wash, a rinse, and dehydration of the washing held in the dehydration tack 44 are performed.
[0005]
[Problem(s) to be Solved by the Invention] Since the washing machine of the configuration of said former was performing the change of transfer and not transmitting to the dehydration shaft of rotation of a drive motor, according to the spring-clutch device which is an one-way clutch, it was not able to make

only an one direction rotate a dehydration tack. Moreover, since a spring-clutch device always twisted a spring and rotated a dehydration tack, when grease went out, it had occurred [the allophone]. Moreover, in order to acquire sufficient torque-transmission force, the rate of lengthening a spring and occupying in the height direction of a clutch was large. Moreover, since electromagnetic brake could not be used, when a band-brake device was needed and brakes were applied, the allophone had occurred. Moreover, since a band-brake device has the function to which a dehydration shaft is made to fix only in an one direction, when a dehydration tack is fixed and wash and a rinse are performed only by the impeller, in order to prevent corotation of a dehydration tack, the one-way clutch to which a dehydration shaft is made to fix needed to be prepared in hard flow.

[0006]

[Means for Solving the Problem] By this invention's solving the technical problem which such a conventional configuration has, forming the Rota engagement gear tooth in Rota, and considering each tooth form of an engagement clutch as a spline configuration, it supposes that an engagement clutch device is made thin and it connotes in Rota, and a driving gear is thin-shape-ized, it makes it possible to make the height of the whole washing machine low, and the washing machine which can perform ejection of clothing easily is offered.

[0007]

[Embodiment of the Invention] The wash shaft turning around the impeller which invention indicated to claim 1 is arranged by the dehydration shaft made to rotate a dehydration tack and said dehydration shaft on the same axle, and was arranged in said dehydration tack, The moderation device by which connects said wash shaft to an output side, connects a driving shaft to an input side, and endocyst is carried out into said dehydration shaft, Said dehydration shaft is set as rotation of the drive motor made to rotate said dehydration shaft and said driving shaft and said drive motor un-transmitting [transfer or]. And the Rota engagement gear tooth in which it is the washing machine equipped with the engagement clutch device which fixes a dehydration shaft at the time of un-transmitting, Rota of said drive motor was connected with the lower part of said driving shaft, and said engagement clutch device was prepared in said Rota, The movable clutch equipped with the quiescence engagement gear tooth formed in the quiescence part, the movable engagement gear tooth A which is engaging with said dehydration shaft and gears alternatively for said Rota engagement gear tooth or said quiescence engagement gear tooth, and the movable engagement gear tooth B, Constitute from a clutch migration means to which said movable clutch is moved, and said quiescence engagement gear tooth and said Rota engagement gear tooth are located up and down. Said movable clutch is arranged movable up and down between said quiescence engagement gear tooth and said Rota engagement gear tooth. Tooth form of said movable engagement gear tooth A and said movable engagement gear tooth B, said Rota engagement gear tooth, and said quiescence engagement gear tooth is considered as a spline configuration, and said engagement clutch device is connoted in Rota.

[0008] since the washing machine which makes the above configuration an operation gestalt formed in Rota the Rota engagement gear tooth which is the engagement section with a movable clutch -- the path of the Rota engagement gear tooth -- large -- it can take -- in addition -- and the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and a quiescence engagement gear tooth are written as a spline configuration, and though the sufficient torque-transmission force and reinforcement are obtained and thin-shape-ize even if dental height is low, durability can maintain. It can gear by this, a clutch device can be connoted inside a rotor, thin shape-ization of the driving gear of a washing machine can be realized, and it is possible to make the height of the whole washing machine low. Moreover, since the engagement clutch is used, both directions can be made to rotate a dehydration tack. Moreover, it has not been said that an allophone occurs with a grease piece like a spring-clutch device. Moreover, since a dehydration shaft is fixed by engagement, there is no need of preparing an one-way clutch, and components mark can be reduced. Moreover, since electromagnetic brake can be used, there is no need of establishing a band-brake device, and components mark can be reduced.

[0009] In addition to invention according to claim 1, invention indicated to claim 2 considers the

engagement section of a movable clutch and a dehydration shaft as a spline configuration.
[0010] Since the sufficient torque-transmission force and reinforcement are obtained even if dental height is low by making this configuration into an operation gestalt, though thin-shape-ized, the durability of a movable clutch can be maintained.
[0011] In addition to invention according to claim 1 or 2, invention indicated to claim 3 uses a DC motor for a drive motor. Each number of teeth of the quiescence engagement gear tooth formed in the movable engagement gear tooth A and the movable engagement gear tooth B which were formed in the movable clutch, the Rota engagement gear tooth formed in Rota, and the quiescence part is made into the pole and the same number of a drive motor, or a multiple. When it energizes without sending a rotation signal to a drive motor, said movable engagement gear tooth A, the Rota engagement gear tooth, and said movable engagement gear tooth B and a quiescence engagement gear tooth are attached so that it may come to the physical relationship of engagement, respectively.
[0012] After rotation of Rota of a drive motor stops by making this configuration into an operation gestalt, and energizing without sending a rotation signal to a drive motor and fixing Rota, by switching a clutch, engagement is ensured and silence can be attained.
[0013] In addition to invention according to claim 3, invention indicated to claim 4 makes the taper-like section tooth form of at least one or more engagement entries among the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and a quiescence engagement gear tooth.
[0014] After rotation of Rota stops, the washing machine which makes this configuration an operation gestalt After energizing without sending a rotation signal to a drive motor and fixing Rota, when switching a clutch Though the assembly precision of an engagement clutch device and the precision of tooth form are bad and the location of engagement of the movable engagement gear tooth A, the Rota engagement gear tooth, or the movable engagement gear tooth B and a quiescence engagement gear tooth is shifted slightly, since the entry of engagement becomes large, engagement is ensured and silence can be attained.
[0015] In addition to invention of a publication, invention indicated to claim 5 constitutes at least one or more of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and the quiescence engagement gear teeth from resin in any 1 term at least, inside it is claim 1 thru/or 4.
[0016] Even if it slams sudden starting, sudden acceleration, or the brake for a drive motor by making this configuration into an operation gestalt at the time of wash, a rinse, and dehydration or repeats normal rotation reversal, it can control that the collision sound of gear teeth occurs by the backlash of engagement.
[0017] In addition to invention given in any 1 term, invention indicated to claim 6 prepares a buffer member between a movable clutch and Rota at least, inside it is claim 1 thru/or 5.
[0018] When the Rota engagement gear tooth formed in Rota gears with the movable engagement gear tooth A formed in the movable clutch by making this configuration into an operation gestalt, there can be low the collision sound generated when a movable clutch and Rota collide.
[0019] It is claim 1 thru/or of 6 in invention indicated to claim 7 at least, it is worn, and, in addition to invention given in ** 1 term, makes thickness of a movable clutch thicker than other parts near the engagement section with a dehydration shaft.
[0020] Though the movable clutch which moves up and down by making this configuration into an operation gestalt is thin-shape-ized, levelness can be maintained, and a clutch can be switched smoothly.

[0021]
[Example] (Example 1) It explains, referring to drawing 1 -4 about the example 1 of this invention below. Drawing 1 is the sectional view showing the whole this example configuration, and drawing 2 shows the sectional view of the driving gear of the washing machine at the time of the dehydration tack rotation in this example. Drawing 3 shows the sectional view of the driving gear of the washing machine at the time of the dehydration tack immobilization in this example. Moreover, drawing 4 is the

decomposition perspective view of the engagement clutch device of the washing machine in this example. In addition, this example 1 shows one desirable example of invention concerning claim 1 and two publications.

[0022] As shown in drawing 1 , in the body 1, the receiver barrel 3 supported by the suspension 2 was formed, and it has the dehydration tack 4 which served as laundry sink in the receiver barrel 3. The dehydration tack 4 is carrying out opening of the top panel, and can throw in the washing now from a top panel. Moreover, at the pars basilaris ossis occipitalis, it has an impeller 5, and has many holes in the side face. The dehydration tack 4 is being fixed to the dehydration shaft 7 of the hollow currently supported by bearing 6. Moreover, the impeller 5 is being fixed to the wash shaft 9 currently supported by bearing 8 inside the dehydration shaft 7. This wash shaft 9 led to the output side of the moderation device 10 by which endocyst is carried out to the dehydration shaft 7, and the driving shaft 11 has led to the input side. Rota 13 of the drive motor 12 made to rotate a driving shaft 11 and the dehydration shaft 7 is connected with the lower part of a driving shaft 11, and the wash shaft 9, the dehydration shaft 7, the moderation device 10, and the drive motor 12 are arranged on the same shaft. The movable clutch 14 is engaging with the dehydration shaft 7 free [sliding] up and down, and movable engagement gear-tooth A14a and movable engagement gear-tooth B14b are prepared. It is prepared in Rota 13 so that the Rota engagement gear tooth 15 may gear with movable engagement gear-tooth A14a, the compression spring 16 is formed so that the movable clutch 14 may be energized for the Rota engagement gear tooth 15, and the end is combined with the dehydration shaft 7. Moreover, it is prepared in the quiescence part 17 so that the quiescence engagement gear tooth 18 may gear with movable engagement gear-tooth B14b. As shown in drawing 2 or drawing 3 , the quiescence engagement gear tooth 18 and the Rota engagement gear tooth 15 are in up-and-down physical relationship, and the movable clutch 14 is engaging with the dehydration shaft 7 so that it may be movable up and down at the meantime. Moreover, each tooth form of movable engagement gear-tooth A14a, movable engagement gear-tooth B14b, the Rota engagement gear tooth 15, and the quiescence engagement gear tooth 18 has spline composition. Moreover, the engagement section 24 of the movable clutch 14 and the dehydration shaft 7 also has spline composition. Moreover, the cylindrical cam 19 is formed above Rota 13, and opening of a top panel and the base is carried out. The cam guide 22 which projected the pin 21 inserted in the cam groove 20 of a cylindrical cam 19 is being fixed to the quiescence part 17. Moreover, a supporter 23 is formed in the lower part of a cylindrical cam 19, and the movable clutch 14 is supported. And the endocyst of the engagement clutch device which consists of the movable clutch 14, the Rota engagement gear tooth 15 formed in Rota 13, a quiescence engagement gear tooth 18 formed in the quiescence part 17, a cylindrical cam 19, and a cam guide 22 is carried out into Rota 13.

[0023] Actuation of this example is explained below. In the stroke which fixes a dehydration tack 4 and performs wash and a rinse only by rotation of an impeller 5, in drawing 4 , a cylindrical cam 19 is seen from the Rota 13 side, and is rotated clockwise. According to the inclined plane of a cam groove 20, it moves up, showing around at the pin 21 of the cam guide 22 with which the cylindrical cam 19 was inserted in the cam groove 20 at this time. This is interlocked with, and the movable clutch 14 supported from the bottom with the supporter 23 of a cylindrical cam 19 moves up, and movable engagement gear-tooth A14a gears, and is canceled of the Rota engagement gear tooth 15 formed in Rota 13. And as shown in drawing 3 , it gears with the quiescence engagement gear tooth 18 with which movable engagement gear-tooth B14b was prepared in the quiescence part 17, and the dehydration shaft 7 is fixed. The location of engagement of movable engagement gear-tooth B14b and the quiescence engagement gear tooth 18 can be doubled by the location of engagement of movable engagement gear-tooth B14b and the quiescence engagement gear tooth 18 not suiting at this time, but rotating an impeller 5 and causing corotation of a dehydration tack 4 through wash water or the washing, although a dehydration tack 4 may not be fixed. Consequently, the movable clutch 14 does not transmit rotation of a drive motor 12 to the dehydration shaft 7, but rotates only a driving shaft 11. Consequently, rotation of a drive motor 12 is slowed down according to the moderation device 10, becomes [being transmitted to an impeller 5, and] through the wash shaft 9, and gives mechanical power to the washing-ed. In this way, wash and a rinse of the washing held in the dehydration tack 4 are performed.

[0024] Moreover, a dehydration tack 4 is rotated, and it is made to rotate in the direction contrary to the process which described the cylindrical cam 19 above, and is made to move caudad in the stroke which performs wash, a rinse, and dehydration. The movable clutch 14 also moves caudad according to a self-weight and the elastic force of a compression spring 16, and movable engagement gear-tooth B14b gears, and is canceled of the quiescence engagement gear tooth 18 formed in the quiescence part 17. And as shown in drawing 2 , it gears with the Rota engagement gear tooth 15 with which movable engagement gear-tooth A14a was prepared in Rota 13, rotation of a drive motor 12 is transmitted to the dehydration shaft 7, a driving shaft 11, the dehydration shaft 7, and the moderation device 10 synchronize, and are rotated, and it rotates, without also slowing down the wash shaft 9 according to the moderation device 10. Although the location of engagement of movable engagement gear-tooth A14a and the Rota engagement gear tooth 15 may not suit at this time, the location of engagement can be easily doubled by rotating Rota 13. Consequently, a dehydration tack 4 and an impeller 5 synchronize and rotate. In this way, wash, a rinse, and dehydration of the washing-ed held in the dehydration tack 4 are performed.

[0025] Although immobilization of a dehydration tack 4 and a rotational change are performed by clenching movable engagement gear-tooth B14b and one's quiescence engagement gear tooth 18, or clenching movable engagement gear-tooth A14a and one's Rota engagement gear tooth 15 as stated above Since it is prepared in Rota 13, the Rota engagement gear tooth 15 can take a large path, and even if the height of the gear tooth of the Rota engagement gear tooth 15 and movable engagement gear-tooth A14a is small, it can obtain the sufficient torque-transmission force and reinforcement. Moreover, since each tooth form of movable engagement gear-tooth A14a, movable engagement gear-tooth B14b, the Rota engagement gear tooth 15, and the quiescence engagement gear tooth 18 is considered as the spline configuration and the sufficient torque-transmission force and reinforcement are obtained even if the height of each gear tooth is small, durability can be maintained though an engagement clutch device is thin-shape-ized. Moreover, since the engagement section 24 of the movable clutch 14 and the dehydration shaft 7 is also considered as the spline configuration, durability can be maintained though the movable clutch 14 is thin-shape-ized, since it is the same. Moreover, it is possible to be able to gear by this, to be able to connote a clutch device in Rota 13, to be able to realize thin shape-ization of the driving gear of a washing machine, and to make the height of the whole washing machine low. Moreover, since the engagement clutch device is used, both directions can be made to rotate a dehydration tack 4. Moreover, an allophone does not occur with a grease piece like a spring-clutch device. Moreover, since the dehydration shaft 7 is fixed by engagement, there is no need of preparing an one-way clutch, and components mark can be reduced. Moreover, since electromagnetic brake can be used, there is no need of establishing a band-brake device, and components mark can be reduced.

[0026] (Example 2) It explains, referring to drawing 5 and drawing 6 about the example 2 of this invention next. The same sign is given to the same component as the above-mentioned example 1, and the explanation is omitted. Drawing 5 is drawing which looked at the physical relationship of engagement of an engagement clutch device from under Rota 13. Moreover, drawing 6 is drawing showing having processed the taper configuration and having made one engagement entry configuration of the gear tooth of an engagement clutch device into the taper-like section 25. In addition, an example 2 shows one desirable example of invention concerning claim 3 and four publications.

[0027] The DC motor of 12 poles is used for the drive motor 12. Moreover, 12 of each number of teeth of movable engagement gear-tooth A14a, movable engagement gear-tooth B14b, the Rota engagement gear tooth 15, and the quiescence engagement gear tooth 18 are prepared at intervals of 30 degrees. Without sending a rotation signal to a drive motor 12, when it energizes, Rota 13 is spacing of 30 angle of rotation, and is fixed to one location of 12 places. As shown in drawing 5 , it gears in one of these locations, and each gear tooth of a clutch device is attached so that it may come to the physical relationship of engagement. Moreover, as shown in drawing 6 , the engagement entry of the Rota engagement gear tooth 15 and the quiescence engagement gear tooth 18 serves as the taper-like section 25.

[0028] The stroke and dehydration tack 4 which fix a dehydration tack 4 with the above configurations,

and perform wash and a rinse only by rotation of an impeller 5 are rotated, when moving the movable clutch 14 up and down and switching the stroke which performs wash, a rinse, and dehydration, it energizes without sending a rotation signal to a drive motor 12 first, and Rota 13 is fixed to one location of 12 places. Then, a cylindrical cam 19 is rotated, the movable clutch 14 is moved up and down, and a clutch is switched. Since each gear tooth of movable engagement gear-tooth A14a, the Rota engagement gear tooth 15, and the movable engagement gear-tooth B14b and the quiescence engagement gear tooth 18 surely serves as physical relationship of engagement at this time, engagement and engagement discharge of a gear tooth and a gear tooth are ensured in the case of the change of a clutch. Although the location of engagement is doubled in the example 1 by rotating an impeller 5 and causing the train of attendants of a dehydration tack 4 through wash water or the washing when the quiescence engagement gear tooth 18 does not gear with movable engagement gear-tooth B14b of the movable clutch 14 Since the cylindrical cam was pressing down the movable clutch 14 to the direction of the quiescence engagement gear tooth 18 when the location of engagement is not correct, the moment the location of engagement suited, the quiescence engagement gear tooth 18 geared with movable engagement gear-tooth B14b to the back deeply suddenly, and there was a possibility that a collision sound might occur then. Moreover, when the Rota engagement gear tooth 15 did not gear with movable engagement gear-tooth A14a of the movable clutch 14, the location of engagement was doubled by rotating Rota 13 of a drive motor 12, but the moment the location of engagement suited, the Rota engagement gear tooth 15 geared with movable engagement gear-tooth A14a to the back deeply suddenly according to a self-weight and the energization force of a compression spring, and the movable clutch 14 had a possibility that a collision sound might occur then. In this example, since it can move up and down slowly by the cylindrical cam 19 until engagement of each gear tooth completes a movable clutch, since engagement and engagement discharge of a gear tooth and a gear tooth are ensured in the case of the change of a clutch, the above collision sounds do not occur and silence of engagement can be attained. Moreover, since tooth form of each engagement entry of the Rota engagement gear tooth 15 and the quiescence engagement gear tooth 18 is made into the taper-like section 25, When the attachment precision of an engagement clutch device and the precision of tooth form were bad, and it energizes, without sending a rotation signal to a drive motor 12 and Rota 13 is fixed to one location of 12 places Since the tooth form entry is large even if the engagement location is shifted slightly, engagement and engagement discharge of a gear tooth and a gear tooth can be ensured, and silence can be attained.

[0029] (Example 3) It explains, referring to drawing 7 about the example 3 of this invention next. This example shows one desirable example of invention which is what constituted the Rota engagement gear tooth 15 from resin, and relates to claim 5 publication. The operation control of wash, a rinse, and dehydration can be performed freely, without being able to suppress that the collision sound of a gear tooth and gear teeth occurs by the backlash of engagement, and caring about a collision sound, even if it slams sudden starting, sudden acceleration, or the brake for a drive motor 12 at the time of wash, a rinse, and dehydration or repeats normal rotation reversal by this configuration. Moreover, as the example 1 described, since the Rota engagement gear tooth 15 is considered as the spline configuration when a large path can be taken, a reinforcement-problem is not generated even if it is resin.

[0030] (Example 4) It explains, referring to drawing 8 about the example 4 of this invention next. The same sign is given to the above-mentioned example 1 thru/or the same component as 3, and the explanation is omitted. In addition, this example shows one desirable example of invention concerning claim 6 publication.

[0031] Drawing 8 forms the buffer member 26 between the movable clutch 14 and Rota 13. Since the movable clutch 14 and Rota 13 do not collide directly when the Rota engagement gear tooth 15 formed in movable engagement gear-tooth A14a prepared in the movable clutch 14 by this configuration and Rota 13 gears, a collision sound can be stopped.

[0032] (Example 5) It explains, referring to drawing 9 about the example 5 of this invention next. The same sign is given to the above-mentioned example 1 thru/or the same component as 4, and the explanation is omitted. In addition, this example shows one desirable example of invention concerning claim 7 publication.

[0033] Drawing 9 makes thickness of the movable clutch 14 thicker than other parts near the engagement section 27 with the dehydration shaft 7. Although thin shape-ization of the movable clutch 14 which moves up and down by this configuration is attained, levelness can be raised, a clutch can be switched smoothly, and a reliable engagement clutch device can be offered.
[0034]
[Effect of the Invention] The dehydration shaft which is made to rotate a dehydration tack according to invention indicated to claim 1, and the wash shaft turning around the impeller which it is arranged by said dehydration shaft on the same axle, and was allotted in said dehydration tack, The moderation device by which connected said wash shaft to the output side, has connected the driving shaft to an input side, and endocyst is carried out into said dehydration shaft, Said dehydration shaft is set as rotation of the drive motor made to rotate said dehydration shaft and said driving shaft and said drive motor un-transmitting [transfer or]. And the Rota engagement gear tooth in which it had the engagement clutch device which fixes a dehydration shaft at the time of un-transmitting, Rota of said drive motor was connected with the lower part of said driving shaft, and said engagement clutch device was prepared in said Rota, The movable clutch equipped with the quiescence engagement gear tooth formed in the quiescence part, the movable engagement gear tooth A which is engaging with said dehydration shaft and gears alternatively for said Rota engagement gear tooth or said quiescence engagement gear tooth, and the movable engagement gear tooth B, Constitute from a clutch migration means to which said movable clutch is moved, and said quiescence engagement gear tooth and said Rota engagement gear tooth are located up and down. Said movable clutch is arranged movable up and down between said quiescence engagement gear tooth and said Rota engagement gear tooth. Since it is the washing machine which considers each tooth form of said movable engagement gear tooth A and said movable engagement gear tooth B, said Rota engagement gear tooth, and said quiescence engagement gear tooth as a spline configuration, and is characterized by connoting said engagement clutch device in Rota Durability can be maintained, though the sufficient torque-transmission force and reinforcement are obtained and thin-shape-ize, even if the height of each gear tooth of an engagement clutch device is low. Moreover, it can gear by this, a clutch device can be connoted inside a rotor, thin shape-ization of the driving gear of a washing machine can be realized, and it is possible to make the height of the whole washing machine low. Moreover, since the engagement clutch is used, both directions can be made to rotate a dehydration tack. Moreover, it has not been said that an allophone occurs with a grease piece like a spring-clutch device. Moreover, since a dehydration shaft is fixed by engagement, there is no need of preparing an one-way clutch, and components mark can be reduced. Moreover, since electromagnetic brake can be used, there is no need of establishing a band-brake device, and components mark can be reduced.
[0035] Since according to invention indicated to claim 2 the engagement section of a movable clutch and a dehydration shaft was considered as the spline configuration and the sufficient torque-transmission force and reinforcement are obtained even if dental height is low, though thin-shape-ized, the durability of a movable clutch can be maintained.
[0036] According to invention indicated to claim 3, a DC motor is used for a drive motor. Each number of teeth of the quiescence engagement gear tooth formed in the movable engagement gear tooth A and the movable engagement gear tooth B which were formed in the movable clutch, the Rota engagement gear tooth formed in Rota, and the quiescence part is made into the pole and the same number of a drive motor, or a multiple. Since said movable engagement gear tooth A, the Rota engagement gear tooth, and said movable engagement gear tooth B and a quiescence engagement gear tooth were attached so that it might come to the physical relationship of engagement, respectively when it energized without sending a rotation signal to a drive motor After rotation of Rota of a drive motor stops, and energizing without sending a rotation signal to a drive motor and fixing Rota, by switching a clutch, engagement is ensured and silence can be attained.
[0037] Since at least one or more engagement entries of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and a quiescence engagement gear tooth were made into the taper-like section according to invention indicated to claim 4 When switching a

clutch after rotation of Rota stops, and energizing without sending a rotation signal to a drive motor and fixing Rota Since engagement is ensured even if the assembly precision of an engagement clutch device and the precision of tooth form are bad and the location of engagement of the movable engagement gear tooth A, the Rota engagement gear tooth, or the movable engagement gear tooth B and a quiescence engagement gear tooth is shifted slightly, silence can be attained.

[0038] According to invention indicated to claim 5, since at least one or more of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and the quiescence engagement gear teeth were constituted from resin, even if it slams sudden starting, sudden acceleration, or the brake for a drive motor at the time of wash, a rinse, and dehydration or repeats normal rotation reversal, it can suppress that the collision sound of gear teeth occurs by the backlash of engagement.

[0039] Since the buffer member was prepared between a movable clutch and Rota, when the Rota engagement gear tooth formed in Rota gears with the movable engagement gear tooth A formed in the movable clutch according to invention indicated to claim 6, the collision sound generated when a movable clutch and Rota collide can be stopped.

[0040] Since thickness of a movable clutch was made [according to invention indicated to claim 7] thicker than other parts near the engagement section with a dehydration shaft in addition to invention according to claim 1 to 6, though the movable clutch which moves up and down is thin-shape-ized, levelness can be maintained, and a clutch can be switched smoothly.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the washing machine which washes the washing with a dehydration tack.

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PRIOR ART

[Description of the Prior Art] The automatic washing machine currently used conventionally has composition as shown in drawing 10 . That is, in the body 41, the receiver barrel 43 supported by the suspension 42 was formed, and it has the dehydration tack 44 which served as laundry sink in the receiver barrel 43. The dehydration tack 44 is carrying out opening of the top panel, and can throw in the washing now from a top panel. Moreover, at the pars basilaris ossis occipitalis, it has an impeller 45, and has many holes in the side face. The dehydration tack 44 is being fixed to the dehydration shaft 47 currently supported by bearing 46. Moreover, the impeller 45 is being fixed to the wash shaft 49 currently supported by bearing inside the dehydration shaft 47. Rota 53 of a drive motor 52 is connected with the lower part of the driving shaft 51 which this wash shaft 49 leads to the moderation device 50, and leads to the input side of the moderation device 50. Moreover, it has the spring-clutch device 54 for switching transfer and un-transmitting to the dehydration shaft 47 of rotation of a drive motor 52 to the lower part of the dehydration shaft 47, and a part of Rota 53. Moreover, while, as for the dehydration shaft 47, this part connotes the moderation device 50 by forming a shaft-orientations interstitial segment greatly in a path, it also has the function as a brake drum 55. This brake drum 55 constitutes the band-brake device with the brake band (not shown) prepared in that perimeter.
[0003] With the above configuration, a dehydration tack 44 is fixed, and a band-brake device fixes the dehydration shaft 47, and in the process which performs wash and a rinse only by rotation of an impeller 45, the spring-clutch device 54 does not transmit rotation of a drive motor 52 to the dehydration shaft 47, but rotates only a driving shaft 51. Consequently, rotation of a drive motor 52 is slowed down according to the moderation device 50, becomes [being transmitted to an impeller 45, and] through the wash shaft 49, and gives mechanical power to the washing-ed. In this way, wash and a rinse of the washing held in the dehydration tack 44 are performed.
[0004] Moreover, a dehydration tack 44 is rotated, and in the stroke which performs wash, a rinse, and dehydration, a band-brake device releases immobilization of the dehydration shaft 47, the spring-clutch device 54 transmits rotation of a drive motor 52 to the dehydration shaft 47, and synchronizes and rotates a driving shaft 51, the dehydration shaft 47, and the moderation device 50, and it rotates, without also slowing down the wash shaft 49 according to the moderation device 50. Consequently, a dehydration tack 44 and an impeller 45 synchronize and rotate. In this way, wash, a rinse, and dehydration of the washing held in the dehydration tack 44 are performed.

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EFFECT OF THE INVENTION

[Effect of the Invention] The dehydration shaft which is made to rotate a dehydration tack according to invention indicated to claim 1, and the wash shaft turning around the impeller which it is arranged by said dehydration shaft on the same axle, and was allotted in said dehydration tack, The moderation device by which connected said wash shaft to the output side, has connected the driving shaft to an input side, and endocyst is carried out into said dehydration shaft, Said dehydration shaft is set as rotation of the drive motor made to rotate said dehydration shaft and said driving shaft and said drive motor un-transmitting [transfer or]. And the Rota engagement gear tooth in which it had the engagement clutch device which fixes a dehydration shaft at the time of un-transmitting, Rota of said drive motor was connected with the lower part of said driving shaft, and said engagement clutch device was prepared in said Rota, The movable clutch equipped with the quiescence engagement gear tooth formed in the quiescence part, the movable engagement gear tooth A which is engaging with said dehydration shaft and gears alternatively for said Rota engagement gear tooth or said quiescence engagement gear tooth, and the movable engagement gear tooth B, Constitute from a clutch migration means to which said movable clutch is moved, and said quiescence engagement gear tooth and said Rota engagement gear tooth are located up and down. Said movable clutch is arranged movable up and down between said quiescence engagement gear tooth and said Rota engagement gear tooth. Since it is the washing machine which considers each tooth form of said movable engagement gear tooth A and said movable engagement gear tooth B, said Rota engagement gear tooth, and said quiescence engagement gear tooth as a spline configuration, and is characterized by connoting said engagement clutch device in Rota Durability can be maintained, though the sufficient torque-transmission force and reinforcement are obtained and thin-shape-ize, even if the height of each gear tooth of an engagement clutch device is low. Moreover, it can gear by this, a clutch device can be connoted inside a rotor, thin shape-ization of the driving gear of a washing machine can be realized, and it is possible to make the height of the whole washing machine low. Moreover, since the engagement clutch is used, both directions can be made to rotate a dehydration tack. Moreover, it has not been said that an allophone occurs with a grease piece like a spring-clutch device. Moreover, since a dehydration shaft is fixed by engagement, there is no need of preparing an one-way clutch, and components mark can be reduced. Moreover, since electromagnetic brake can be used, there is no need of establishing a band-brake device, and components mark can be reduced.
[0035] Since according to invention indicated to claim 2 the engagement section of a movable clutch and a dehydration shaft was considered as the spline configuration and the sufficient torque-transmission force and reinforcement are obtained even if dental height is low, though thin-shape-ized, the durability of a movable clutch can be maintained.
[0036] According to invention indicated to claim 3, a DC motor is used for a drive motor. Each number of teeth of the quiescence engagement gear tooth formed in the movable engagement gear tooth A and the movable engagement gear tooth B which were formed in the movable clutch, the Rota engagement gear tooth formed in Rota, and the quiescence part is made into the pole and the same number of a drive motor, or a multiple. Since said movable engagement gear tooth A, the Rota engagement gear tooth, and

said movable engagement gear tooth B and a quiescence engagement gear tooth were attached so that it might come to the physical relationship of engagement, respectively when it energized without sending a rotation signal to a drive motor After rotation of Rota of a drive motor stops, and energizing without sending a rotation signal to a drive motor and fixing Rota, by switching a clutch, engagement is ensured and silence can be attained.

[0037] Since at least one or more engagement entries of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and a quiescence engagement gear tooth were made into the taper-like section according to invention indicated to claim 4 When switching a clutch after rotation of Rota stops, and energizing without sending a rotation signal to a drive motor and fixing Rota Since engagement is ensured even if the assembly precision of an engagement clutch device and the precision of tooth form are bad and the location of engagement of the movable engagement gear tooth A, the Rota engagement gear tooth, or the movable engagement gear tooth B and a quiescence engagement gear tooth is shifted slightly, silence can be attained.

[0038] According to invention indicated to claim 5, since at least one or more of the movable engagement gear tooth A, the movable engagement gear tooth B, the Rota engagement gear tooth, and the quiescence engagement gear teeth were constituted from resin, even if it slams sudden starting, sudden acceleration, or the brake for a drive motor at the time of wash, a rinse, and dehydration or repeats normal rotation reversal, it can suppress that the collision sound of gear teeth occurs by the backlash of engagement.

[0039] Since the buffer member was prepared between a movable clutch and Rota, when the Rota engagement gear tooth formed in Rota gears with the movable engagement gear tooth A formed in the movable clutch according to invention indicated to claim 6, the collision sound generated when a movable clutch and Rota collide can be stopped.

[0040] Since thickness of a movable clutch was made [according to invention indicated to claim 7] thicker than other parts near the engagement section with a dehydration shaft in addition to invention according to claim 1 to 6, though the movable clutch which moves up and down is thin-shape-ized, levelness can be maintained, and a clutch can be switched smoothly.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since the washing machine of the configuration of said former was performing the change of transfer and not transmitting to the dehydration shaft of rotation of a drive motor, according to the spring-clutch device which is an one-way clutch, it was not able to make only an one direction rotate a dehydration tack. Moreover, since a spring-clutch device always twisted a spring and rotated a dehydration tack, when grease went out, it had occurred [the allophone]. Moreover, in order to acquire sufficient torque-transmission force, the rate of lengthening a spring and occupying in the height direction of a clutch was large. Moreover, since electromagnetic brake could not be used, when a band-brake device was needed and brakes were applied, the allophone had occurred. Moreover, since a band-brake device has the function to which a dehydration shaft is made to fix only in an one direction, when a dehydration tack is fixed and wash and a rinse are performed only by the impeller, in order to prevent corotation of a dehydration tack, the one-way clutch to which a dehydration shaft is made to fix needed to be prepared in hard flow.

[Translation done.]